Having thus described the preferred embodiments, the invention is now claimed to be:

1. A diagnostic imaging system for displaying a vessel tree comprising:

a means **(30)** for defining a base surface **(32)**;

a means **(50)** for gridding the base surface to define pixels **(52)**;

a means **(62)** for projecting along a normal of each pixel;

a means **(70)** for assigning each pixel a grayscale value based on grayscale value of voxels intersected by a corresponding normal.

2. The system as set forth in claim 1, wherein the base surface defining means **(30)** includes a means **(36)** for determining vessels centerlines **(38)** and further including:

a means **(54)** for mapping the base surface **(32)** to the centerlines **(38)** to define a true form surface **(56)**.

3. The system as set forth in claim 2, further including:

a means **(60)** for defining a wall thickness to the true form surface **(56)**.

4. The system as set forth in claim 3, wherein the grayscale assigning means **(70)** assigns each pixel **(52)** a maximum of grayscale values of voxels within the defined wall thickness intersected by the corresponding normal.

5. The system as set forth in claim 2, further including:

a means **(80)** for determining a globe surface **(84)** including a means **(82)** for mapping the assigned grayscale values into a spherical surface.

6. The system as set forth in claim 5, further including:

a means **(100)** for projecting the globe surface **(84)** into a two dimensional surface.

7. The system as set forth in claim 6, wherein the projecting means **(100)** includes:

a matching means **(104)** which matches coordinates of the spherical surface to coordinates of the two dimensional surface; and

2D grayscale processor **(106)** which assigns each pixel on the two dimensional surface a grayscale value assigned to at least one corresponding pixel on the globe surface **(84)**.

8. The system as set forth in claim 7, further including:

a means **(108)** for selecting at least one of the true form surface, the globe surface and the two-dimensional surface for displaying on a monitor **(90)**.

9. The system as set forth in claim 1, wherein the base surface **(32)** is a sphere or ellipsoid.

10. A diagnostic imaging apparatus **(10)** comprising:

a scanner which examines a region of a subject including coronary arteries and acquires three-dimensional data;

a reconstruction processor for reconstructing the three-dimensional image data into a volumetric three-dimensional image representation;

the diagnostic imaging system of claim 1 for converting a portion of the three dimensional image representation into a coronary arteries tree display; and

a display **(114)** connected to the diagnostic imaging system of claim 1 for displaying the coronary arteries tree in a context of the region of interest.

11. A method of displaying the coronary arteries tree comprising:

defining a base surface;

gridding the base surface to define pixels;

projecting along a normal of each pixel;

assigning each pixel a grayscale value based on grayscale value of voxels an associated normal intersected; and

determining a true surface.

12. The method as set forth in claim 11, wherein the step of defining the base surface includes:

obtaining a substantially spherical volume data;

determining locations of centerlines of vessels in the volume data based on predetermined grayscale value; and

generating a best fitted surface through the centerlines.

13. The method as set forth in claim 12, further including:

translating the base surface along the normals to overlie points, in which the normals intersected associated centerlines; and

defining a spherical thickness which extends in both directions of a boundary of the translated surface.

14. The method as set forth in claim 13, further including:

injecting a subject with a known contrast agent which produces the highest intensity value inside the vessels;

in the step of projecting, searching for points with the highest intensity the associated normal intersected in the determined thickness; and

assigning each pixel a maximum intensity value chosen from a plurality of grayscale values of voxels the associated normal intersected in the determined thickness.

15. The method as set forth in claim 14, further including:

mapping the determined maximum intensity values into the translated surface.

16. The method as set forth in claim 14, further including:

draping the assigned maximum intensity values into the base surface to create a globe image; and

displaying the coronary arteries tree in the globe image which is rotatably visualized.

17. The method as set forth in claim 11, wherein the base surface is a sphere.

18. The method as set forth in claim 11, wherein the base surface is an ellipsoid.

19. A scanner for diagnostic imaging including:

a stationary gantry which defines a subject receiving aperture;

a source of an x-ray radiation rotatably mounted on the gantry, which source transmits x-ray radiation through a subject disposed in a subject receiving aperture;

a two-dimensional radiation detector for detecting radiation transmitted by the source after passage of the radiation through the subject in the subject receiving aperture;

a reconstruction processor which reconstructs x-ray radiation received by the two-dimensional radiation detector into a volumetric image representation;

an image processor for performing the method of claim 11; and

a display for displaying the coronary arteries tree in a context of the region of interest.